Impact of Macroeconomic Factors on Stock Market in the London Stock Exchange

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Abstract

The paper examined impact of macroeconomic factors on stock market in the London stock exchange. There are thousands of variables that exist in the market which could affect stock market. The empirical studies showed that these variables could be interest rate, inflation rate/consumer price index, exchange rate, industrial production, gross domestic product, money supply, oil prices, unemployment rate etc. The study in consideration selects consumer price index, interest rate, and exchange rate as indicator of economy and tests these variables to see their impact on London stock exchange. The data for 10 years is selected in such a way that it could capture events such as quantitative easing and long-term refinancing programs. The research gave insight of how these variables can affect the stock market when other euro-zone risk factors penetrate in the market. The analysis is performed by using multiple regression technique. The estimated regression gives the output that how these three variables have a significant or insignificant relation with the stock market. The results indicated that consumer price index, interest rate, and exchange rate have an impact on stock market in the London stock exchange.

Keywords: consumer price index, interest rate, exchange rate, London stock exchange

1. Introduction

1.1 Background of the Study

According to economic theory, net earnings typically represent the level of economic activity, while stock prices should reflect expectations for future corporate performance. The stock prices should be used as leading indications of future economic activity if they accurately reflect the underlying fundamentals. The relationship between economic indicators and stock returns has been the subject of much research over the past several decades by many academics, professionals, and analysts. It is frequently believed that several fundamental macroeconomic variables, including the interest rate, industrial output, exchange rate, money supply, and inflation rate, are accountable for the stock return. And quite a few models and tests have captured and confirmed macroeconomic conditions' effect on different countries' stock returns (Neifar, M2021).

This research points to recognizing the nature of the relationship between the stock market and three macroeconomic factors. The variable under examination concerns from United Kingdom market stock cost or return as an intermediary for the UK stock market. Macroeconomic factors are inflation, Interest rate (INT), and exchange rate (EXC) for the UK economy. The reason for this investigates to discover whether these indicators impact the stock market or not. In case yes, how they affect. The interest rate has a significant effect. When the Government Open Market Committee changes the interest rate, it impacts both the economy and the stock markets since borrowing becomes either more or less costly for people and businesses (Marry Hall, 2022).

Higher interest rates mean future marked-down valuations are lower as the markdown rate utilized for future cash flow is more elevated. On the other hand, inflation happens when absolute financial weights and the

expectation of future advancements cause the request for products and services to surpass the supply accessible at existing costs or when accessible yield is confined by faltering efficiency and marketplace limitations. In this manner, inflation is one of the compelling macroeconomic factors, which has a negative impact on financial movement (Rostagno et al, 2010). Rising inflation can be expensive for customers, stocks, and the economy. Inflation harms the company's stocks overall since shopper spending drops. Value stocks may do well since their costs haven't kept up with their peers. Development stocks tend to be disregarded by speculators (Zucchi, K., 2022). This paper gives at that point a basis and rules to investors and financial specialists for making venture choices within the UK share market. Too, it may be valuable for the approach and choice creators of the UK economy.

1.2 Statement of the Problem

The study is about identifying if changes in macroeconomic factors affect the London stock trade. To see which financial aspect is considered critical when making any choice. If they have any effect at that point, it is supportive for the analyst or investors to create any investment choice when there's any macroeconomic change. The stock market is a component of a free-market economy. It helps businesses raise cash by advertising stock offers and corporate bonds and helps financial specialists take an interest in the companies' monetary accomplishments, make benefits through capital gains, and win salary through dividends. Since nowadays people are more going toward buying stocks and making investments, financial experts are paying more attention to the factors that may affect stocks. Since Macroeconomic variables give experiences on whether the state of an economy is at its development stages or is in recession, they also offer data to analyze current. Therefore, it is essential for future investment patterns to learn about these macroeconomic variables before making any decisions that may make them lose huge amounts of money. UK government can benefit from this study by arranging to change any indicator, particularly interest rate, customer price index, and exchange rate, they have clear thought about what these changes can do to their stock trade. The research is additionally exceptionally critical since the stock markets of UK are considered to be one of the driving markets even during recession and they are major source of local and worldwide investment from all over the world. Therefore, any change in economy ought to be considered imperative since it can influence stock market.

1.3 Aim/Purpose of the Study

The overall purpose of this research paper is to show which macroeconomic indicators can affect the stock market and which indicator has the major affect the study is applied to London stock exchange and the macroeconomic indicators are taken from London market. The UK government may also benefit from this study since they will know exactly what will happen to their stock market if adjustments are made to any indicator, particularly the interest rate, consumer price index, and exchange rate. The UK stock markets are regarded as one of the top markets, even in times of crisis, and they are a significant source of both domestic and foreign investment from across the world, which makes the research quite essential.

1.4 Research Objectives

The objectives of the research are as follow:

1) To identify whether consumer price index has any impact on stock market in the London stock exchange.

2) To identify whether interest rate has any impact on stock market in the London stock exchange.

3) To identify Whether exchange rate has any impact on stock market in the London stock exchange.

1.5 Research Questions

1) Does consumer price index have an impact on stock market in the London stock exchange?

2) Does exchange rate have an impact on stock market in the London stock exchange?

3) Does interest rate have an impact on stock market in the London stock exchange?

1.6 Research Hypotheses

1Ho: Consumer price index has no impact on stock market in the London stock exchange.

2Ho: Exchange rate has no impact on stock market in the London stock exchange

3Ho: Interest rate has no impact on stock market in the London stock exchange.

1.7 Literature Review

The relationship that exists between macroeconomic factors and the stock market is a critical area of investigation by many analysts, broadly and globally. We have thousands of macrocosmic factors that can influence the stock market. According to (Gjrde & Saettem, 1999) there's a relationship between stock returns and macroeconomic factors in Norway. There are some studies indicates that there is a strong correlation between oil price and stock market. However, on the other hand, few studies concur there's no relationship

between macroeconomic factors and the stock market.

For example, a study by (Flannery & Protopapadakis, 2002) concluded that two well-known measures of total financial action (actual net national item and mechanical production) were unrelated to stock returns. The results of studies by (Cheng & Ng, 1998) and (Sharma, 2002) on the long-term relationship between fundamental macroeconomic factors and stock prices point to a long-term positive relationship between stock prices and growth and production.

According to another research done by (hsing & hsieh, 2012) on a German stock market (Poland). The study took GDP, real intrigued rate, inflation rate, exchange rate, and long-term government bond yield as free factors. The researchers conclude that the real GDP features a positive effect on stock advertise, whereas the real interest rate, exchange rate, inflation rate, and bond yield have a negative effect on the stock market. Therefore, to preserve a significant stock market condition polish government has got to maintain its financial development by diminishing the borrowing at the government level and diminishing the cash appreciation.

At the same time, expansion and intrigued rates are moreover kept at a low level. (Francisco Jareño, 2016) conducted a study to analyzes the relationship between the US stock market and a few pertinent US macroeconomic factors, his consider showed that all the variables appear measurably critical connections with the but for the customer cost list. The US stock market has a positive and factually critical association with the GDP, and unemployment variables, but a negative and factually critical relationship with the intrigued rate components.

There are many researchers with comparative findings, like (Wycliffe Nduga Ouma, 2014), explored the effect of the macroeconomic factors on stock returns in Kenya amid the period 2003-2013, utilizing the Arbitrage Estimating Hypothesis and Capital Resource Estimating Demonstrate (CAPM) system for a month-to-month information. Agreeing to the discoveries of his consider, Cash Supply, exchange rates and inflation influence the stock market returns in Kenya. Cash supply and inflation are found to be critical determinants of the returns at NSE. Trade rates is in any case, found to have a negative effect on stock returns, whereas intrigued rates aren't vital in deciding long rung run returns within the NSE (Wycliffe Nduga Ouma, 2014).

1.7.1 Exchange Rate

Naik (2013) examined the connections between the Indian stock market and five macroeconomic factors, including exchange rates, the industrial output index, the index for wholesale prices the money supply, and the rates on 1994 treasury bills. The study utilized monthly data. In his study, the author applied various techniques for their analysis, including co-integration and a correction model for vector errors. The findings showed that stock prices and money supply had a positive long-term relationship. The study revealed no causal relationship between stock price and money supply in the long or the short run and that money supply only influences stock prices in the long term. The fact that changes in the money supply indirectly impact stock prices via shifting actual output is one theory that has been put forth.

Similar conclusions were reached in Osamuonyi and Evbayiro-(2012) Osagie's investigations, which they used to investigate the link between macroeconomic factors and the Nigerian capital market index. The study examined the short-run dynamics and the long-run relationship between the stock market index and the six chosen macroeconomic variables from the Nigerian economy using annual data from 1975 to 2005 on interest rates, inflation rates, exchange rates, fiscal deficit, GDP, and money supply. Money supply has been discovered to have a significant but negative relationship with the stock marketplace Index in both the short and long term.

According to much research, the exchange rate could have a massive impact on the stock marketplace. For example Jamil and Ullah (2013) examined the effect of forex costs on stock expenses in Pakistan. Using monthly records from 1998 to 2009, they determined that a relationship exists between change costs and stock marketplace returns, each in the short run and long term. The short-run duration turned into determined to have a delicate, however huge relationship, while the long-run courting is not significant.

Also, when the writer examined the elements affecting the overall performance of stock markets of South Asian international locations using monthly data for the duration of 1997 to 2010 of three South Asian countries, specifically Pakistan, India, and Sri Lanka. The examiner hired a descriptive statistic approach for the analysis. The result indicated that exchange rates have a tremendous impact on the overall performance of stock markets of the three needs of South Asia.

Adarmola (2012), determined similar findings when the writer studied Nigeria's exchange rate volatility and stock market behavior. Mechanism the use of quarterly statistics from 1985 to 2009 and observed that exchange rate exerts full-size impact on Nigerian stock marketplace each within the quick and in the end. The observation showed that the exchange rate had a significant positive impact on stock market performance; however, the effects showed that, ultimately, the connection is notably poor.

In research carried out in New Zealand, we look at the relationships between the New Zealand stock Index and a set of seven macroeconomic variables from January 1990 to January 2003 using cointegration assessments. Test and result suggest that the NZSE40 is not a leading indicator in New Zealand, possibly because the brand-New Zealand stock marketplace is surprisingly small compared to the stock markets of other advanced economies.

In standard, New Zealand is continually determined by the interest rate, cash delivery, and actual GDP throughout 1990-2003. Our outcomes recommend that the investment belief of New Zealand is combination of different mature inventory markets, as turned located in Korea, the USA, and Japan. Accordingly, traders who are inquisitive about investing in New Zealand should pay extra attention to the above referred macroeconomic variables in place of the trade price and inflation charge index (Christopher Gan, 2006).

1.7.2 Consumer Price Index

Fama and Gibbon (1982) examine the connection between inflation, actual returns, and capital investment. Their outcomes assist (Mundell, 1963) and (Tobin, 1965) findings that expected actual returns on payments and predicted inflation fees are negatively correlated. The authors propose that this relationship arises with proportion returns because of a tremendous courting among anticipated actual returns on economic assets and natural activity.

Consistent with (French et al., 1987), an interest rate growth could grow the specified rate of going back, and the share charge might decrease with the increase in the interest price. An increase in interest price could improve the funding control and monetary improvements quantity three, issue four, 2006 91 possibility charges of holding cash, and the trades off to protecting other interest-bearing securities could cause a lower proportion charge.

Chen, Roll, and Ross (1986) advised macroeconomic variables systematically affected asset returns, the unfolding between long and short-term interest charges anticipated and unexpected inflation business manufacturing growth, and the spread between excessive and low-grade bonds. Hamoa (1988), determines whether the discovered relationships between macroeconomic variables and percentage returns are applicable when the analysis was carried out inside the Japanese market. The writer also consists of international exchange variables, other than industrial production performing insignificance in asset pricing.

Theoretically, the money supply harms stock prices because as the money growth price increases, the inflation rate is also anticipated to grow; therefore, the stock price should be lower. However, growth in the money supply could stimulate the economy, and company profits would increase. This will probably increase future cash flows and stock charges. (Mukherjee & Naka, 1995). The past ten years have seen researchers expand their examination of the relationship between macroeconomic factors and share returns to nations besides the United States.

For instance, Kwon and Shin (1999), investigated the Korean market and discovered that the production index, exchange rate, trade balance, and money supply correlate with the Korean stock markets. The authors did not realize the stock price index to be a leading indicator for macroeconomic factors. (Leigh, 1997) examined the Singapore Stock Exchange (SSE) and found that the Singapore stock index had no connection to macroeconomic fundamentals, but it was positively correlated with money demand.

1.7.3 Interest Rate

In Taiwan, comparable outcomes were found by Fung and Lie (1999), examines empirically the nature of the impact of the exchange rate and interest rate on Malaysia stock market index. According to the fundings interest rate has negative impact on stock market index. When the interest rate is high, investors will shift their money from higher risk instrument which is the stock market to savings or fixed deposit accounts. On the other hand, when the interest rate is too low, investors will move the money out to invest in stock market in the hope of getting a higher return.

Strohe (2002) looked at small regional markets like Norway and Indonesia and concluded that actual economic activity, oil prices, and oil-exporting countries like Norway favorably impacted stock returns. To determine whether stock prices could act as a leading indicator for macroeconomic variables in the Lithuanian economy or if a group of macroeconomic variables could serve as a leading indicator for stock returns in Lithuania (Donatas & Pilinkus, 2009).

They analyzed relationships between macroeconomic variables and the Lithuanian stock market index. Test results show that the stock market index may be a leading indicator for macroeconomic factors. In contrast, some macroeconomic indicators may function as a leading indicator for stock market returns in Lithuania. His study established correlations between Lithuania's stock market results and most macroeconomic factors. The link between stock return, interest rate, and exchange rates in the Pakistani economy is examined in a 2010 paper by (Muhammad Ishfaq Ahmad). Data on short-term interest rates, currency exchange rates, and stock market returns

from 1998 to 2009 are gathered for this purpose.

A multiple regression model is used to investigate the impact of interest rate and exchange rate changes on stock returns. The findings demonstrate that changes in interest rates and exchange rates had a sizable influence on stock returns across the sample period. The same conclusions are also examined in this essay from a Pakistani viewpoint. The findings make it abundantly evident that stock returns are significantly impacted by changes in interest rates and currency rates. Changes in exchange rates have a beneficial influence, whereas changes in interest rates have a negative one. The impact of currency rates on the Ghanaian stock market was evaluated by (Charles et al., 2008).

They treated Treasury bill rates, money supply, foreign exchange rate, inflation, and trade deficit as separate variables. They were stated that the consumer price index and the stock market had a good link. They also discovered that stock return volatility is high while the inflation rate is high. Overall, their finding demonstrates the importance of the connection between macro factors and stock gains. Mahmudur Alma and Md. Gazi Salah Uddin (2009) stated that interest rates and stock returns differ between industrialized and developing nations. They do a panel regression to explore this by compiling the monthly Stock Exchange Index and interest rate for fifteen nations from January 1998 to March 2003. They concluded that the interest rate and stock returns are negatively correlated.

When Blanchard (1981) looked at output, the stock market, and interest rates, he concluded that beginning inflation might initially cause accurate interest rates to fall and the stock market to vary more. (Kasman Saadet, 2011) Using the Ordinary least squares and generalized autoregressive conditional estimating models, this study examines the impact of interest rate and foreign exchange rate fluctuations on stock returns for Turkish banks. The findings imply that changes in interest rates and currency exchange rates negatively and substantially affect the conditional bank stock return.

Additionally, market return sensitivities for bank stock returns are shown to be higher than those for interest rates and exchange rates, suggesting that market return significantly impacts the dynamics of conditional return for bank stocks. The findings further indicate that the principal factors of conditional bank stock return volatility are interest and exchange rate volatility. The effect of Macroeconomic variables, including the interest rate and inflation rates, on listed company stock prices, was shown. The results were consistent with Blanchard and Tamtom's a priori prediction. A noteworthy conclusion is that over the years 1997 to 2006, the explanatory variables influenced 95.6% of the stock prices of listed businesses in the model.

1.8 Conceptual Framework

We are in a quantitative world. Rankings and performance metrics are standard in domestic politics. Indicators and quantitative evaluations are used to guide economic policy and policies pertaining to environmental preservation, public safety, health care, and education. Macroeconomic indicators are the most noticeable of the many indications that surround us. However, they are anything from unbiased judges of economic performance. There is no self-evident formula for economic growth, inflation, unemployment, or public deficits. Macroeconomic indicators have certain features that distinguish them from other indicators, such as those measuring government transparency or human rights. (Cooley & Snyder, 2015). When inflation figures are used to calculate real growth from nominal increases in the gross domestic product, they are frequently closely related (GDP). Macroeconomic indicators, economic ideas, and ideologies are also described, as shown in discussions about inflation and unemployment. Additionally, they frequently have direct distributive effects, such as when austerity is justified by public debt to GDP ratios. The three most significant variables in the analysis are the consumer price index, real interest rate, and foreign exchange rate. These factors are included in all reputable studies, including those by (Hsing & Hsieh, 2012), (Chen & Sheng, 2009), (Karam & Mittal, 2011). The following is a diagram of the study's created theoretical framework.
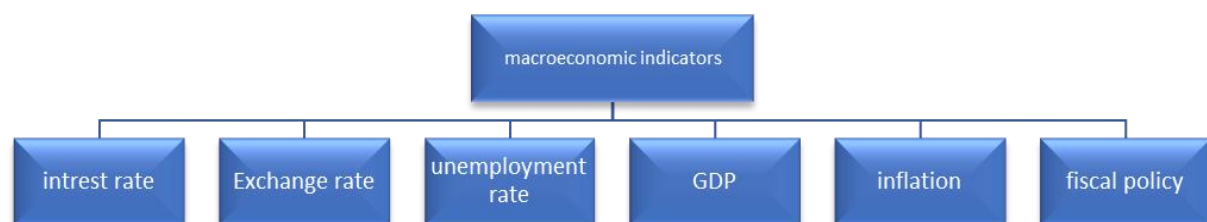

Figure 1.

The figure above shows some of the most significant macroeconomic indicators that can affect the stock market

there are two types of indicators financial indicators such as interest rate, exchange rate and non-financial indicators such as unemployment rate GDP.

1.9 Theoretical Framework

It's crucial to understand macroeconomic indicators and how they could impact the economy, particularly for investors and companies who invest in stocks. They should also know how some of these data might affect the stock market. For instance, the interest rates, the two most critical macroeconomic factors in every economy are interest rates and currency rates. The expense of borrowing money is represented by the interest rate, also known as the cost. It plays a crucial part in an economy. For investors, any fluctuation in interest rates might be problematic. (Md. Mahmudur Alma & Md. Ghazi Salah Uddin, 2009) assessed the link between developed and developing country stock returns and interest rates. They do a panel regression to explore this by compiling the monthly Stock Exchange Index and interest rate for fifteen nations from January 1998 to March 2003. They concluded that the interest rate and stock returns are negatively correlated.

The widespread and ongoing increase in the overall pricing level for goods and services over a certain period is another sign of inflation (Morris & Morris, 1999). Overall, stocks suffer from inflation because consumer spending declines. Because value stocks' prices haven't kept up with their counterparts, they could do well. Investors frequently avoid growth stocks. The exchange rate is another crucial indication that significantly impacts the stock market. Exchange rate volatility affects a nation's financial system, particularly its stock market.

The relationship between exchange rate volatility and stock market returns was shown to have different consequences; in the long run, a depreciation in the local currency improves stock market values. In contrast, it lowers stock market gains in the near term. This is consistent with specific empirical research that claims exchange rate depreciation is advantageous for stock markets, mainly when the stock market is situated in an economy heavily dependent on exports. This suggests that investors using macroeconomic data may predict stock market volatility. Additionally, researchers who ex-post evaluate financial and macroeconomic data may use updated financial and macroeconomic data to examine the equilibrium relationships between these factors and stock market volatility. This is due to the possibility that macroeconomic factors might act as a guide for predicting stock market volatility.

2. Method

2.1 Research Scope/Design

The phase of analysis is based on the collection of data if source and method of collection is high-quality than results are considered to be accurate. The data is gathered from the Reuters 3000X and economics trading website both of them are accurate sources. After collection of data, it is gone through the analysis on E-views 7.0. Before any results and conclusions are drawn the data has gone through Unit Root Testing to see if data is stationary. After checking unit root, it is further tested for multi-collinearity and on the regression results aerial correlation, heteroscedastic, and normality. After removal of these discrepancies in the data the results of regression are estimated and these results a used to satisfy the objective of the study. The equation below shows the London stock exchange (dependent) is a function of consumer price index (CPI), exchange rate (Exrate), and interest rate (IR). This estimated regression equation will help to understand the impact of independent variable on the dependent variable. It also tests the level of significance for each variable which can ultimately tell us tendency of influence by independent variables on the dependent variable. We can write the equation in following manner.

$$DLNLSE = \alpha_1 + \beta_1 DLNCPIUK + \beta_2 DLNEXRATEUK + \beta_3 DLNINTERESTUK + u_t$$

• DLNLSE: Log difference of London stock exchange

• DLNCPIUK: Log difference of inflation

• DLNEXRATEUK: Log difference of exchange rate

• DLNINTERESTUK: Log difference of interest rate

3. Results and Discussions

(1) Distribution of Responses on Question Number 1

Does consumer price index have an impact on London stock exchange? Consumer Price Index (CPI) is the main economic indicator that is used to track the inflation rate and the cost of living in a country. When the CPI is rising it means that consumer prices are also rising, and when it falls it means consumer prices are generally falling. In short, a higher CPI indicates higher inflation, while a falling CPI indicates lower inflation, or even deflation. In that respect CPI figures can be very important for forex markets particularly, since the rate of inflation impacts on monetary policy decisions and the interest rates set by central banks. Stock markets

typically aren't moved as much by CPI data but can be since higher interest rates can cause business activity to slow. In general stock markets prefer a lower CPI that allows consumers to keep spending, and business to continue investing. The results also suggest that CPI has inverse effect on LSE which means if CPI increases the market will move in opposite direction. According to the studies in different markets when CPI increases the spending or investment from the investors decreases.

(2) Distribution of Responses on Question Number 2

Does exchange rate have an impact on London stock exchange? According to this theory, currency depreciation result in higher exports and hence an increase in company profits which will ultimately attract investors resulting in the share price increasing based on the portfolio balance approach, exchange rates are determined by market mechanism. An expected increase in stock prices due to economic growth prospects would attract capital from foreign investors and hence causes an increase in the demand for the country's currency and vice versa. Therefore, if exchange rate moves up in other words if dollar appreciates and pound depreciates stock market will move up and vice versa.

(3) Distribution of Responses on Question Number 3

Does interest rate have an impact on London stock exchange? As a general rule, when central banks raise interest rates, stock prices tend to fall. Conversely, when central banks lower interest rates, stock prices tend to rise. This is because higher interest rates translate to higher borrowing costs for businesses. When this happens, a company might spend more on getting loans or they might trim down their business expansion plans. If companies slow down their growth due to increased loan prices, it could cause their share prices to fall.

Alternatively, when interest rates decrease, the cost of doing business tends to decrease, too. If it's cheaper for businesses to get loans, they might speed up their plans to expand, which could increase their overall output and help them bring in larger quarterly revenues. As a result, that company's share prices could rise. If enough companies have increased stock prices, this could cause market indices to increase, too. According to the regression model's findings, interest rates are thought to be the essential variable that might affect the London Stock Exchange. When altering interest rates in the economy, the UK government must use extreme caution. On the other hand, when changes in interest rates occur in the economy, investors or researchers can come to an accurate conclusion

3.1 Unit Root Test

The Unit root test is performed on each variable, and the results of these tests are used to determine if the data is stationary. Initial testing of the raw data (Level data) reveals that all variables have a unit root (not stationary). The results are based on the states of intercept, trend, and intercept, and no movement and intercept it was proposed that the data had a unit root in all three states, as shown in the following table.

Table 1.

Unit Root Test						
Using Level Data						
	Consumer Price Index		**Interest Rate**		**Exchange Rate**	
States	P value(5%)	T statistics(5%)	P value(5%)	T statistics(5%)	P value(5%)	T statistics
Intercept	18.91%	(2.25) 2.88	79.79%	(0.85) 2.88	24.49%	(2.10) 2.88
Intercept, trend	6.75%	(3.32) 3.44	67.56%	(1.84) 3.44	31.27%	(2.53) 3.44
No intercept, trend	60%	(0.22) 1.94	25%	(1.07) 1.94	57%	(0.31) 1.94

Table 1 shows the results of the test which demonstrate that all three variables' P values in all three states exceed the 5% threshold value. Any outcome derived from such can result in skewed estimate. The Augmented Dickey-Fuller test statistic's (value indicated in parenthesis) lower significance threshold is further supported by the T statistics findings. The first difference is calculated to eliminate this unit root, and the Augmented Dickey-Fuller test is estimated on all three states. "As the table shows in CPI column of t statistics in intercept state dickey fuller statics is 2.25 which is less than 2.88 t value at 95% significance level," which suggests that the data has a unit root. Table 2 below displays the results:

Table 2.

Unit Root Test								
Using first difference Data								
	Consumer Price Index			Interest Rate			Exchange Rate		
States	P value(5%)	t statistics(5%)		P value(5%)	t statistics(5%)		P value(5%)	t statistics
Intercept	0.00%	(8.88)	2.88	0.00%	(5.16)	2.88	0.00%	(7.37)	2.88
Intercept, trend	0.00%	(8.86)	3.44	0.00%	(5.18)	3.44	0.00%	(7.42)	3.44
No intercept, trend	0.00%	(8.90)	1.94	0.00%	(5.12)	1.94	0.00%	(7.40)	1.94

Table 2 According to the Augmented Dickey-Fuller test results, all three variables' P values in all three states are less than the 5% critical value. The data is considered to have no unit root in any of the variables if the null hypothesis, which is stated on each unit root test results in Exhibit 2, is accepted. It is claimed that the data is steady and that using it to achieve the goal will not result in any biased estimation.

Serial correlation: As differential log is taken on the data and results of Breusch-Godfrey Serial Correlation LM Test reveals following results.

Table 3.

Breusch-Godfrey Serial Correlation LM Test:

F-statistic	0.305798	Prob. F(2,112)	0.7371
Obs*R-squared	0.640861	Prob. Chi-Square(2)	0.7258

Table 3 From an economic standpoint, the findings in the preceding table demonstrate that the Probability Chi square is 72%, which is more than the 5% essential value, and that there is no serial correlation in the data. All of the projected findings for the Prob value (P value) are higher than the 5% threshold, which further confirms that the calculated regression does not include serial correlation. With 95% certainty, the estimated results now demonstrate that there is no serial correlation in the regression's estimated residuals.

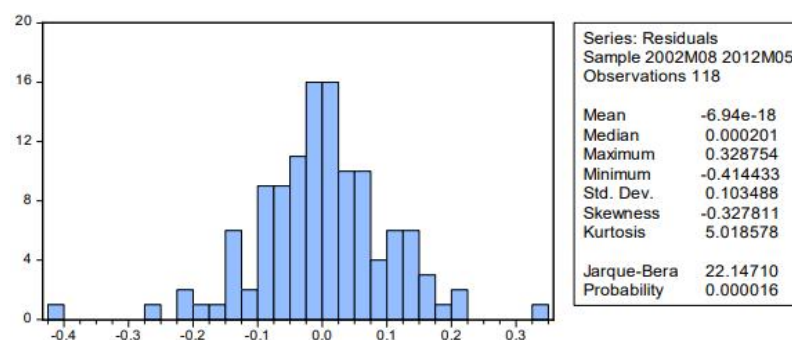| Series: Residuals	
Sample 2002M08 2012M05	
Observations 118	
Mean	-6.94e-18
Median	0.000201
Maximum	0.328754
Minimum	-0.414433
Std. Dev.	0.103488
Skewness	-0.327811
Kurtosis	5.018578
Jarque-Bera	22.14710
Probability	0.000016

Figure 2. The data normality

The cash flows appear to be normally distributed under the curve, but the P value is less than 5%, indicating that they are not. The entire model doesn't appear to follow a normal distribution. There is no serial correlation, no

hetrosecdasy, and the residuals are not typical, according to the results of serial correlation, hetrosecdasy, and normalcy.

3.2 Results

The multiple regression results are estimated on the data to see whether if stock market prices are affected by the macro-economic factors. The estimated regression results are shown below in Table 4 below.

Table 4.

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.008203	0.009893	0.829209	0.4087
DLNCPIUK	-0.099775	0.074841	-1.333167	0.1851
DLNEXRATEUK	-0.825036	0.436633	-1.889540	0.0614
DLNINTERESTUK	-0.044519	0.109005	-0.408407	0.6837
R-squared	0.596843	Mean dependent var		0.008289
Adjusted R-squared	0.570760	S.D. dependent var		0.106000
S.E. of regression	0.104840	Akaike info criterion		-1.639443
Sum squared resid	1.253034	Schwarz criterion		-1.545521
Log likelihood	100.7271	Hannan-Quinn criter.		-1.601308
F-statistic	1.867497	Durbin-Watson stat		1.954226
Prob(F-statistic)	0.139059			

The results shown above in the table the values of coefficient and constant can be written in equation.

$$DLNLSE = -0.820\% - 9.975\% \ DLNCPIUK - 82.503\% \ DLNEXRATEUK - 4.451\% \ DLNINTERESTUK + 10.48\%$$
$$(0.0748481) \ (0.43663) \ (0.1090)$$

Now from the equation each variable is explained independently in light of its significance and change it could produce in London stock exchange

4. Test of Hypotheses

4.1 Test of First Hypothesis

1Ho: consumer price index has no impact on London stock exchange. According to the above-mentioned estimated results, the London Stock Exchange moves by 9.975% whenever the consumer price index (CPI) changes by 1% while maintaining all other independent variables constant. According to the studies in different markets when CPI increases the spending or investment from the investors decreases or in other words the investors became reluctant to invest in risky options which ultimately affect the stock market. The CPI is major factor that represents economic growth if there is increase in economic activity then definitely CPI become lower or stable at particular level. At this point there is increase in cash flow which gives uplift to the stock market. Whenever the CPI increase this will also affect the risk-free rate and it also affect the investors required rate of return, if required rate of return becomes higher in risk free investments investors likely to take opportunity to invest in risk free option. Therefore, considering these findings, the study concludes that, consumer price index, exchange rate have a considerable impact on the London Stock Exchange the first hypotheses has been rejected.

4.2 Test of Second Hypothesis

2Ho: exchange rate has no impact on London stock exchange. The foreign exchange rate is another leading factor that can bring substantial change in the stock exchange of a country. The study shows that the London stock exchange move 82% when there is 1% change occur in foreign exchange rate holding other independent variables constant. The exchange rate coefficients also showed the inverse effect, if exchange rate moves up in other words if dollar appreciates and pound depreciates stock market will move up and vice versa.

The impact of independent variables on dependent is seen in regression results now the study looks the significance of variables by checking its P value and T statistics. The P value is 6.14%, if 95% confidence level

is considered the general rule of thumb suggests that the value if greater than 5% critical value. Whereas T statistics also verify by showing that 1.88 is less than significance level at 95% confidence. By considering these results study proves that the hypothesis of exchange rate has no impact on London stock exchange is rejected. Interest rate has no impact stock market in the London stock exchange.

According to the study's 10-year data, interest rates have an average of 3.5% and a standard deviation of roughly 2%, which appears to be very steady. The UK stock market's performance is regarded as among the world's finest because of these interest rate rules. The Bank of England's most recent study indicates that the UK uses interest rates to manage inflation. As a result of the inverse link between these two factors, if the UK wishes to manage its inflation, it must also control its interest rates, which in turn affect the stock market directly.

The idea of quantitative easing is used because interest rates have been set at such low levels in recent years that additional reductions have little impact on inflation. it is seen that the interest rate is highly significant. By looking at the results the P value of CPI is 9.96% whereas P value of Interest rate is 68% which is way higher. Therefore, the hypothesis has been rejected.

According to the studies in different markets when CPI increases the spending or investment from the investors decreases or in other words the investors became reluctant to invest in risky options which ultimately affect the stock market. The CPI is major factor that represents economic growth if there is increase in economic activity then definitely CPI become lower or stable at particular level. At this point there is increase in cash flow which gives uplift to the stock market. Whenever the CPI increase this will also affect the risk-free rate and it also affect the investors required rate of return, if required rate of return becomes higher in risk free investments investors likely to take opportunity to invest in risk free option.

The foreign exchange rate is another leading factor that can bring substantial change in the stock exchange of a country.

There are number of studies that suggest that the economies whose currencies are appreciating against US dollar their stock market move negatively against it (Saunders, 2010). When investors or researchers decide whether to invest or pursue other goals, they also consider the exchange rate because significant changes may impact them. The results (as shown in table of the study), show that the London stock exchange move 82% when there is 1% change occur in foreign exchange rate holding other independent variables constant. The exchange rate coefficients also showed the inverse effect; if exchange rate moves up in other words if dollar appreciates and pound depreciates stock market will move up and vice versa. Therefore, hypothesis number two has been rejected.

4.3 Test of Third Hypothesis

3Ho: interest rate has no impact on London stock exchange. According to the study's 10-year data, interest rates have an average of 3.5% and a standard deviation of roughly 2%, which appears to be very steady. The UK stock market's performance is regarded as among the world's finest because of these interest rate rules. The Bank of England's most recent study indicates that the UK uses interest rates to manage inflation. As a result of the inverse link between these two factors, if the UK wishes to manage its inflation, it must also control its interest rates, which in turn affect the stock market directly. The idea of quantitative easing is used because interest rates have been set at such low levels in recent years that additional reductions have little impact on inflation. It is seen that the interest rate is highly significant. By looking at the results the P value of CPI is 9.96% whereas P value of Interest rate is 68% which is way higher. Therefore, the hypothesis has been rejected.

According to the studies in different markets when CPI increases the spending or investment from the investors decreases or in other words the investors became reluctant to invest in risky options which ultimately affect the stock market. The CPI is major factor that represents economic growth if there is increase in economic activity then definitely CPI become lower or stable at particular level. At this point there is increase in cash flow which gives uplift to the stock market. Whenever the CPI increase this will also affect the risk-free rate and it also affect the investors required rate of return, if required rate of return becomes higher in risk free investments investors likely to take opportunity to invest in risk free option.

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rejected.

5. Conclusion and Recommendations

The research to study the relation between macroeconomic factor and stock exchange carries great importance after 50's. The researchers, investors, and academics try to find new ways to see if they found any logical patterns and they get maximum advantage of this relationship. This research could give some idea that how these macroeconomic fluctuations can affect the stock market and based on these findings one could make a clear decision after economic changes. Now the research in consideration carried London stock exchange (dependent variable) and interest rate, consumer price index, and exchange rate (independent variables) as macro-economic factors. Ten years' data have taken from Reuters 3000X and some of the results are validated from economics trading website.

The results of the regression found that the null hypothesis of significance in all three cases (Interest rate, CPI, exchange rate) cannot be rejected. So, it shows that the variables have significant effect on London stock exchange. After that study tries explaining which variables is most significant impact on LSE. The results showed that the interest rate is considered to be most significant in UK economy. The consumer price index is also considered to be significant variable, but the results of study establish that it is important, but CPI has less significance than interest rate. The exchange rate seems significant, but it has least effect on stock market.

The past few decades, the interaction of share returns, and the macroeconomic variables has been a subject of interest among academics and practitioners. It is often argued that stock prices are determined by some fundamental macroeconomic variables such as the interest rate, the exchange rate and the inflation. It is important for investors, business, to know about these indicators before they invest on any businesses because they provide insights on whether the state of an economy is at its expansion stages or its contraction stage, popularly known as recession.

Furthermore, macroeconomic indicators provide pieces of information to analyze current and future trends of investment. Macroeconomic indicators are essential to any trader because they can significantly influence market movements. This is why the most fundamental analysis will incorporate macroeconomic indicators. For investors, businesses, or any company to have a great portfolio or investment and to avoid losses, they should first study these indicators or have a specific understanding of how they impact the market and when to buy and sell the stocks. Also, developed and undeveloped countries' government should know how to use these indicators at the right time, for example, when to increase and decrease the interest rate to help their economy and have a suitable economy.

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